Internal Medical Residents' Ability to Diagnose and Characterize Major Depression

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The purpose of this study was to assess medical residents' knowledge of symptom criteria and subtypes of major depressive episode and their accuracy in diagnosing major depressive disorders and classifying episode severity and subtype according to criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. Thirty-five third-year internal medicine residents completed a self-administered, written instrument containing 2 open-ended questions and 21 hypothetical scenarios. The sensitivity for recognizing major depressive disorder was 64%, and the specificity was 69%. The sensitivity for classifying severity was 86% for mild, 66% for moderate, 71% for severe, and 66% for severe with psychosis. Misclassification of severity was most commonly to a less severe class. For scenarios with a diagnosable subtype of a major depressive disorder, the sensitivity for classification was 34% for atypical, 51% for catatonic, 74% for melancholic, 100% for postpartum, and 94% for seasonal depression. When asked to enumerate the criteria symptoms for depression, 80% or more of the residents listed sad mood, loss of interest, weight change, and sleep disturbances; 14 to 21 (40%–60%) listed thoughts of death and worthlessness; other criteria were listed by 7 to 11 (20%–31%). When asked to list the episode subtypes, none was listed by more than 3 (9%) residents, although 13 (37%) residents volunteered psychotic as a subtype. Residents frequently failed to recognize the presence or absence of major depressive disorder and often misclassified episode severity and subtype on scenarios. Few could spontaneously list the episode subtypes. Methods must be developed to improve the recognition and classification of major depressive episodes to better direct treatment.

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The ability to recognize, diagnose, and treat major depressive disorder (MDD) is among the growing number of clinical competencies expected of primary care physicians. Previous studies have shown that primary care physicians often incorrectly conclude that depression is present when it is not and fail to identify patients who have the disease.[1–12] Moreover, when generalist physicians do diagnose depression, they do not effectively treat the disease,[8,13–19] using incorrect medications, inadequate dosages, and insufficient treatment duration. Although it is apparent that depression is often not properly diagnosed in primary care settings, the factors underlying this problem are less clear. Possible explanations include physicians' failure to consider the possibility of depression as the cause of the observed symptoms, inadequate knowledge of either the diagnostic criteria for depression or the proper treatment for the condition, a reluctance to manage mental health illnesses, or institutional and procedural barriers to treatment.

Clinical guidelines represent one strategy to overcome gaps in clinicians' knowledge about depression. Guidelines of the Agency for Health Care Policy and Research (AHCPR) for the diagnosis and treatment of depression[20,21] emphasize that the disorder is diagnosed by history, based on the nine criteria symptoms for a major depressive episode (MDE). Once the diagnosis is reached, specific treatment choices depend on the episode's severity (mild, moderate, severe without psychosis, or severe with psychosis) and specific subtype when applicable (atypical, catatonic, melancholic, seasonal, or postpartum), as well as concurrent conditions, current medications, and the patient's response to previous treatment. For example, a mild episode, according to the guidelines, may warrant a limited course of clinical follow-up before any

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ABBREVIATIONS USED IN TEXT
AHCPR = Agency for Health Care Policy and Research
DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
MDD = major depressive disorder
MDE = major depressive episode

intervention is attempted, whereas moderate episodes should be treated pharmacologically. Optimal treatment also varies by subtype; for instance, atypical episodes respond better to monoamine oxidase inhibitors than to tricyclic antidepressants, whereas some catatonic episodes may require electroconvulsive therapy.

Therefore, the purpose of this study was to assess medical residents' knowledge of the diagnostic criteria used in the AHCPR depression guidelines, with a special focus on assessing severity and subtype of depressive episodes. This aspect has not been previously evaluated. The objectives of this study were to assess internal medical residents' knowledge of the criteria symptoms and subtypes of MDE and to use validated clinical scenarios to evaluate internal medicine residents' ability to diagnose MDD and classify episode severity and subtype.

Subjects and Methods

Study Population

Third-year residents in the University of Minnesota School of Medicine's Internal Medicine Residency Program assigned to continuity clinics at the Minneapolis Veterans Affairs Medical Center were eligible for the study. Of 38 eligible residents, 35 participated, for a participation rate of 92%. Informed consent was obtained from all subjects before participation.

Definitions

Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (*DSM-IV*),[22] criteria for MDE are as follows:

- One of the two mandatory symptoms, sad mood or loss of interest, must be present;
- There must be a total of five symptoms among sad mood, loss of interest, sleep disturbance, weight change, psychomotor abnormalities, fatigue, feelings of worthlessness, concentration difficulties, and preoccupation with death;
- The symptoms must be present for at least two weeks and cause significant impairment in the patient's life (the impairment criterion was added to the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition*, criteria);
- The symptoms are not caused by an underlying medical condition or a substance; and
- The symptoms do not meet the criteria for a mixed episode or a bereavement reaction.

A patient with MDE can be diagnosed with MDD if there is no evidence of bipolar disorder and the mood symptoms are not due to an underlying psychotic condition. Severity, in the *DSM-IV*, is based on a symptom count and the degree of impairment in a patient's life. The *DSM-IV* subtype definitions were used.

Scenario Development

We developed a set of clinical scenarios to assess residents' ability to diagnose and classify episodes of depression. The scenarios were designed to reflect the diagnosis of depression according to *DSM-IV* criteria. Generating the scenarios involved two steps: specifying clinical patterns derived from the diagnostic criteria and then constructing two specific scenarios to represent each of the clinical patterns. Clinical patterns specify symptom constellations that "rule in" or "rule out" the diagnoses of depression based on *DSM-IV* criteria. We abstracted clinical patterns from the *DSM-IV* definitions of MDE, MDD, episode severity, and episode subtype. For example, the absence of both mandatory symptoms (sad mood and loss of interest) in the presence of five or more total symptoms excludes the diagnoses of MDE. Figure 1 shows the clinical patterns we derived.

Symptoms were randomly selected to match the clinical patterns. Descriptions of the symptoms were taken from a validated screening instrument for depression, the Inventory to Diagnose Depression[23] or from the *DSM-IV*. Additional information was added to some of the scenarios to match the clinical patterns: specification of a recent death, duration of symptoms less than two weeks, season, postpartum condition, coexisting medical or psychiatric conditions, and current medications. For the scenarios missing both of the two mandatory symptoms, we explicitly stated that the patient denies any sad feelings or loss of interest in his or her normally joyful activities.

Sex, age (18–75 years old), and symptom duration (2–16 weeks) were added to the scenarios. "Red herrings" were also used, so that the mere presence of a specific situation would not necessarily signal the correct diagnosis. For example, we did not want the occurrence of a birth to always signal postpartum depression. The generated scenarios were then edited for readability and consistency. Figure 2 shows two examples of clinical patterns and their respective scenarios.

Validity of Scenarios and Solutions

To achieve content validity, scenarios were generated to the precise *DSM-IV* definitions using symptom descriptions from the Inventory to Diagnose Depression or the *DSM-IV*, as described earlier. The scenarios were then reviewed by two psychiatrists and further edited according to their recommendations, to ensure face validity. For example, elderly and male patients were restricted to having weight loss and not weight gain. Also, symptoms were adjusted to correspond with other psychiatric diagnoses (such as schizophrenia) and severity.

A "gold standard solution" for each scenario was developed as the consensus of two additional staff psychiatrists (S.D. and S.W.) explicitly instructed to independently answer the questions in adherence with the *DSM-IV*

Patterns Not Meeting Criteria for Major Depressive Episode (MDE)
Missing a mandatory symptom, ≥5 total symptoms
Insufficient number of symptoms
Insufficient duration of symptoms
Symptoms caused by a medical condition
Symptoms caused by a medication
Symptoms caused by substance abuse
Symptoms better accounted for by bereavement reaction

Patterns Meeting Criteria for MDE, But Not Meeting Criteria for Major Depressive Disorder (MDD)
Schizoaffective or schizophrenic disorder
Previous manic episode

Patterns Meeting Criteria for Major Depressive Disorder
Mild depression
Moderate depression
Severe without psychosis depression
Severe with psychosis depression
Atypical subtype
Catatonic subtype
Melancholic subtype
Postpartum subtype
Seasonal subtype

Figure 1.—These clinical patterns of depression are based on definitions of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition.*[22]

criteria. Disagreements were resolved by reviewing the *DSM-IV* criteria. Scenarios for which there remained a difference of opinion were modified to remove the elements of contention. Agreement between the two psychiatrists on their initial evaluation of the scenarios was evaluated using Cohen's κ.[24] For the classification of episode severity, $\kappa = 0.67$, representing "substantial" agreement.[25] For the classification of episode subtype, $\kappa = 0.88$, showing "almost perfect" agreement. For the diagnosis of MDD, there was less agreement, $\kappa = 0.56$, indicating "moderate" agreement, in part because one of the psychiatrists answered all the questions with regard to MDE, and the other assessed MDD. Some of the cases were designed to represent instances of MDE and not of MDD (such as a patient with bipolar disorder), accounting for most of the discrepancies. Complete agreement was reached for all cases.

Study Instrument

Each study instrument included 2 open-ended questions, followed by 21 clinical scenarios with associated questions

Clinical Pattern
Missing a mandatory symptom for major depressive disorder, but >5 total criteria symptoms
Clinical Scenario
A 22-year-old man tells you that he frequently thinks of dying in passive ways (such as going to sleep and not waking up), doesn't sleep as well as usual, has been pacing more than an hour per day, can't sit still, feels extremely guilty most of the time, is unable to make some decisions, has lost more than 25 lb, and is exhausted almost all of the time. This has been going on for the past 13 weeks. The patient denies feeling sad and continues all his previous hobbies.

Clinical Pattern
Melancholic depression
Clinical Scenario
A 49-year-old man tells you "I am less interested in several of my usual activities and am so unhappy that I can't stand it. I feel I am inferior to most people. I frequently think of dying in passive ways (such as going to sleep and not waking up). I feel extremely slowed down physically, like I am stuck in mud. I frequently sleep at least 2 hours less than usual, waking up early in the morning before I would normally awaken. I get tired from doing almost anything. I've lost more than 25 lb. I get almost no pleasure from most of the activities that I usually enjoy, although when something pleasant happens or someone tries to cheer me up, I feel a little better but still feel somewhat depressed. My depression is regularly worse in the morning. I feel extremely guilty most of the time. There is a definite difference between this depression and the depression I would feel after someone close had died." This has been present for the past 8 weeks. His wife gave birth to a daughter 3 weeks ago.

Figure 2.—These clinical patterns and associated scenarios were created for this study.

TABLE 1.— *Residents (n= 35) Listing Criteria Symptoms and Episode Subtypes on Open-ended Questions*

Criteria Symptom	*Residents Listing Symptom, No. (%)*
Weight	34 (97)
Sleep disturbance	32 (91)
Loss of interest (mandatory)	30 (86)
Sad mood (mandatory)	28 (80)
Thoughts of death	21 (60)
Worthlessness/guilt	14 (40)
Impaired concentration	11 (31)
Fatigue	9 (26)
Psychomotor	7 (20)
Episode Subtype	Residents Listing Subtype
Melancholic	3 (9)
Catatonic	2 (6)
Postpartum	2 (6)
Seasonal	2 (6)
Atypical	1 (3)
Psychotic	13 (37)

in a separate booklet. The open-ended questions were as follows: "What are the symptoms of a major depressive episode enumerated in *DSM-IV*?" and "What are the subtypes of a major depressive episode in *DSM-IV*?"

The 21 clinical scenarios included 12 scenarios followed by the question, "Does this patient meet *DSM-IV* criteria for a major depressive disorder? (yes or no)." Four scenarios (1 for each level of severity) posed the question: "How severe is the patient's depression? (Choose the single best answer: mild, moderate, severe without psychosis, or severe with psychosis.)" Five scenarios (1 for each subtype) were used to evaluate the question, "Can you further subtype the patient's depression? (Choose the single best answer: atypical, catatonic, melancholic, postpartum, or seasonal.)" The scenarios appeared in random order in the booklet, with all diagnostic scenarios appearing before the classification scenarios.

Measurements

To assess knowledge of the diagnostic criteria for depression, we measured the percentage of subjects listing each of the diagnostic criteria symptoms. A symptom was considered correct if it is one of the criteria or if the *DSM-IV* mentions it as indicative of a criterion. To assess the knowledge of episode subtypes, we measured the percentage of subjects listing each of the subtypes. For the diagnoses of MDD and the classification of episode severity, we measured mean sensitivity and specificity per resident. For the classification of episode subtype, we determined only sensitivity. Specificity was not determined for episode subtype because the specificity depends on the definition of a noncase, for which there are several possibilities: patients with other diagnosable subtypes (a subset of patients), patients with MDE, or patients with MDD.

Results

Knowledge of Criteria Symptoms and Subtypes

Table 1 shows the percentage of residents listing each criterion symptom on the open-ended question. Weight change and sleep disturbance were the two most frequently listed symptoms. Slightly fewer residents listed the two mandatory symptoms, sad mood and loss of interest. Less than two thirds listed thoughts of death and feelings of decreased self-worth. The other symptoms, impaired concentration, fatigue, and psychomotor effects, were only listed by less than a third of the residents. Of the two mandatory symptoms, every resident listed at least one of them, and 23 residents listed them both. The distribution of the number of criteria symptoms listed by the residents is shown in Figure 3.

Few of the residents could list the episode subtypes on the open-ended question (Table 1). The most common answer, psychotic depression, is considered a level of severity and not a subtype in the *DSM-IV* classification.

Diagnosis of MDD and Classification of Episode Severity and Subtype

The mean sensitivity per resident for diagnosing MDD was 64% (SD = 33%; 95% confidence interval, 53%–75%), based on three scenarios per subject. The mean specificity was 69% (SD = 21%; 95% confidence interval, 62%–76%), based on nine scenarios per subject.

The distribution of responses, sensitivities, and specificities for classifying the levels of severity is shown in Table 2. The sensitivities for classification of moderate, severe, and psychotic episodes were lower than for mild episodes. For all levels of severity, specificity was higher than sensitivity. The presence of psychosis (that is, hallucinations or delusions) was most commonly noted with hallucinations and more often missed with delusions (data not shown). Of the 39 misclassified episodes, 30 were classified as less severe and 9 as more severe.

The sensitivity for the classification of subtype, based on one scenario of each subtype per resident, was 34% for atypical, 51% for catatonic, 74% for melancholic, 100% for postpartum, and 94% for seasonal.

Discussion

The goals of this study were to evaluate medical residents' knowledge of the symptoms and subtypes of major depression and to assess proficiency in diagnosing and classifying depressive episodes. We found that most resident physicians knew only a few of the diagnostic symptom criteria defined in *DSM-IV* and that sensitivity and specificity for the diagnosis were low. Sensitivity for the classification of episode severity was high for mild episodes and somewhat lower for moderate and severe episodes. The specificity for the classification of severity at all levels was fairly high. Most residents did not know the *DSM-IV* subtypes of MDE and, on scenarios, had difficulty determining episode subtype.

Residents' lack of knowledge of the criteria symptoms for MDD may be responsible for the low diagnostic

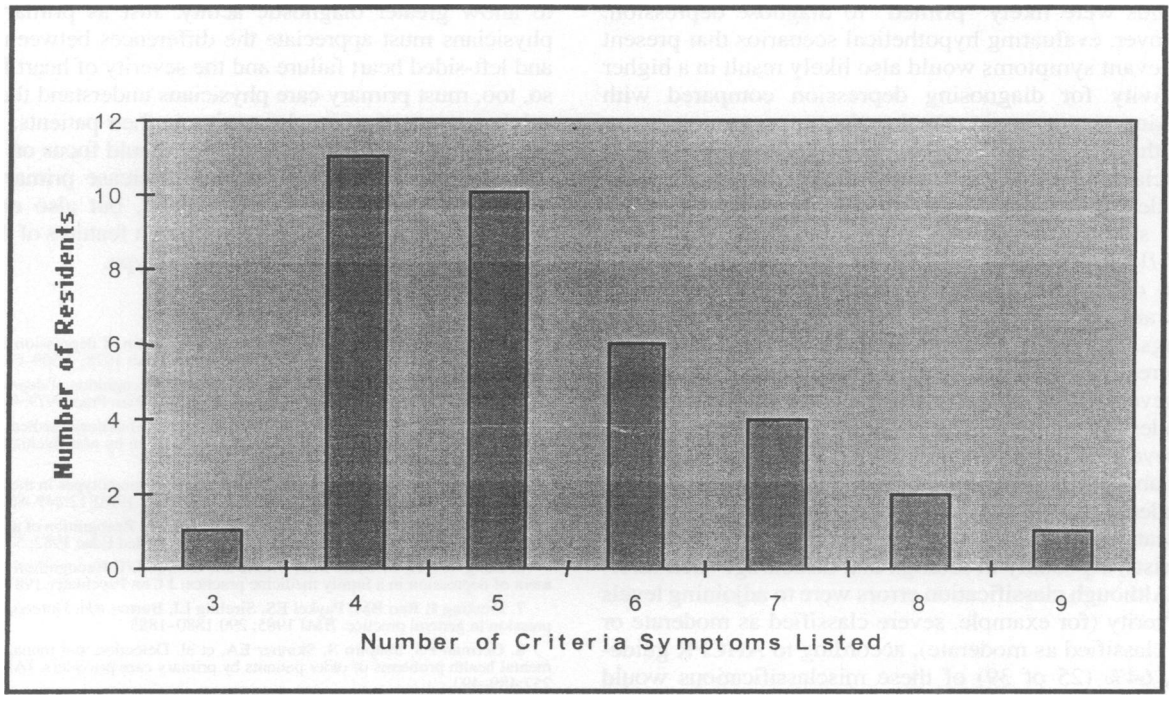

Figure 3.—Distribution of the number of criteria symptoms listed by residents.

accuracy we observed in this study and may also underlie to some extent the underrecognition of depression in primary care settings. The two mandatory symptoms, sad mood and loss of interest, were known by 28 (80%) and 30 (86%) residents, respectively. Twelve (34%) residents listed four or fewer of the criteria symptoms; five of the criteria are needed to make the diagnosis.

Two other studies have attempted to ascertain knowledge of the criteria symptoms for MDE. Rapp and Davis[26] also found poor recall of the diagnostic criteria in a survey of medical residents (with more stringent scoring criteria), ranging from 84% for "appetite/weight change" to 6% for "self-reproach, guilt," "diminished concentration," and "thoughts of death/suicide." Similarly, in a survey of 36 general practitioners, Bowers and co-workers[27] found low recall of the diagnostic symptoms, ranging from 28 (78%) for "insomnia or hypersomnia" to 2 (6%) for "feelings of worthlessness or guilt" and "recurrent thoughts of death or suicidal ideation." Failure to assess the appropriate symptoms of depression could lead to low diagnostic sensitivity or to low specificity.

Both the sensitivity and specificity for the diagnosis of depression were slightly less than 70%. Compared with previous studies evaluating the diagnosis of depression by residents in clinical settings,[1,2,4,5,10–12] we found a higher sensitivity and a lower specificity. These studies found sensitivities from 20.5% to 67% and specificities from 81% to 91%. The higher sensitivity and lower specificity we found may have been because our subjects could not be blinded to this study's focus on depression

TABLE 2.—*Distribution of Responses, Sensitivities, and Specificities for Classifying Severity of Depression Episodes**

	Residents' Classification (n = 35)					
Depression	*Mild*	*Moderate*	*Severe*	*Psychotic*	*Mean Sensitivity (95% CI), %*	*Mean Specificity (95% CI), %*
DSM-IV Classification†						
Mild	30	5	0	0	86 (74–97)	92 (88–97)
Moderate	8	23	4	0	66 (50–82)	81 (74–88)
Severe	0	10	25	0	71 (56–87)	90 (84–95)
Psychotic	0	5	7	23	66 (50–82)	100

*CI = confidence interval, *DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*
†From the American Psychiatric Association.[22]

and thus were likely "primed" to diagnose depression. Moreover, evaluating hypothetical scenarios that present all relevant symptoms would also likely result in a higher sensitivity for diagnosing depression compared with assessing symptoms in actual patients.

Although several studies have evaluated whether physicians diagnose depression when it is present, none have determined whether physicians appreciate the severity or subtype of episodes of this disorder according to *DSM-IV*. Recognizing episode severity, however, is critical to optimal management, which primary care physicians are now expected to provide in many health care settings. The residents whom we evaluated were less likely to correctly perceive the severity of more serious (moderate, severe, or psychotic) episodes compared with milder episodes. The implications of failing to recognize moderate, severe, or psychotic episodes of depression as such are clear and potentially serious: these patients may be prone to undertreatment; may not receive needed antipsychotic medications; or may not have appropriate referrals to psychiatrists, especially in settings that discourage such referrals. Although classification errors were to adjoining levels of severity (for example, severe classified as moderate or mild classified as moderate), according to AHCPR guidelines, 64% (25 of 39) of these misclassifications would potentially result in undertreatment or overtreatment.

The ability of the subjects to spontaneously name the episode subtypes was extremely limited, and sensitivity for classifying atypical, catatonic, and melancholic episodes was low. Although subtype classification is emphasized by AHCPR guidelines, exact classification may be clinically less important than the correct recognition of episode severity. Yet, there are specific treatment recommendations for the different subtypes: atypical episodes respond better to monoamine oxidase inhibitors than to tricyclic antidepressants; catatonic episodes may require electroconvulsive therapy; melancholic episodes require either pharmacologic or electroconvulsive treatment and should not be treated only with psychotherapy; women with postpartum depression should be admitted to the hospital and treated medically; and seasonal depression may not respond to medication or psychotherapy, but phototherapy is an option for some patients.

The limitations of this study are principally related to the use of hypothetical cases. As noted earlier, this format may overestimate residents' ability to evaluate symptoms of depression (that is, symptom pursuit). In addition, because all participants were from a single training program, we cannot be sure that our results generalize to residents in other training programs.

This study is consistent with the large body of evidence indicating that non–mental health specialists frequently fail to recognize the presence or absence of major depression. We have further demonstrated that when evaluating hypothetical cases, medical residents often fail to appreciate the severity and type of depression presented, possibly leading to less-than-optimal treatment. Efforts to improve care for depression in primary care settings must, therefore, not focus solely on the recognition of depression but go further to allow greater diagnostic acuity. Just as primary care physicians must appreciate the differences between right- and left-sided heart failure and the severity of heart failure, so, too, must primary care physicians understand the more subtle aspects of major depression in their patients. Future educational and research initiatives should focus on developing methods that will not only increase primary care physicians' recognition of depression, but also enhance their appreciation of clinically important features of depression, such as episode severity and subtype.

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